Ontario

Ministry of
Transportation and
Communications

MI-81

REPORT FOR SOILS REFERENCE SAMPLES 1.84 AND 2.84

MATERIALS INFORMATION

ENGINEERING MATERIALS OFFICE

Soils and Aggregates Section
Engineering Materials Office
1201 Wilson Avenue
Central Building, Room 311
Downsview, Ontario M3M 1J8
Telephone: (416) 248-3286

85 05 22

TO: Participants in Correlation Program

SUBJECT: Soil Reference Sample #'s 1.84 and 2.84

Gentlemen:

Enclosed is your copy of the Final Report on the test results of Soil Reference Sample #'s 1.84 and 2.84.

These data include a table of results for your laboratory and a set of scatter diagrams. Your laboratory number appears at the top of the table of results.

Yours truly,

Ian G. Bullen.

I.G. Bullen,
Laboratory Operations
Supervisor (Acting).

IGB/jlo
Attachment

NOTES ON DATA PRESENTATION

1. TABLE OF TEST RESULTS

a. Column 1 - This lists the test number as designated in the M.T.C. Laboratory Testing Manual and the individual test segments.

b. Columns 2 & 3 - List the individual data for the pair of samples. NT means not tested, and * means measurement rejected.

c. Columns 4 & 5 - List the mean test data for the pair of samples for all laboratories performing the test.

d. Columns 6 & 7 - List the "Standardized Deviate" for each test result. This is a measure of how close an actual test result is to the mean for all similar test results (for one sample). It is obtained by subtracting the actual test result (X_1) from the mean ($\overline{X}$), and dividing by the standard deviation(S). A negative sign means that the test result is smaller than the mean, and no sign means the test result is equal to or larger than the mean.

e. Columns 8 & 9 - List the "Laboratory Ratings", which, in effect, are similar to the "Standardized Deviate", but in a simpler numerical form.

The ratings are as follows:

5 - test result within ½ standard deviation from $\overline{X}$
4 - " 1 "
3 - " 1½ "
2 - " 2 "
1 - " 2½ "
0 - test result has been rejected as an outlier.

As before, a negative sign indicates a result that is smaller than the mean.

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2. SCATTER DIAGRAMS

The points on these diagrams are designated by letters - each letter representing a laboratory. The points are located by plotting the value obtained for the first (odd number) sample on the horizontal axis against the value obtained for the second (even numbered) sample on the vertical axis. If the results from two or more laboratories happen to intersect at the same point, the symbols & or ? are used. An * represents a point which is off the chosen scale. The scales are chosen, wherever possible, to give the most informative display of the plotted points. If a point is off the scale, it does not necessarily mean that it is outside the limits noted above.

The horizontal and vertical dashed lines forming the cross on the plot represent the median values for the two samples.

The data below the scatter diagram consists of the mean, median, standard deviation, and standard error of the mean for both samples.

NOTE:

As data is obtained for additional pairs of samples, a graphical construction will be made of the laboratory ratings. This will give, at a glance, a picture of the laboratory performance, and will indicate error trends. These will be included with future reports. For further details on the correlation programs, please refer to the following reports:

EM-30; "Interlaboratory Study of the Precision of Some Aggregate Tests - Interim Report", by C.A. Rogers & Lise Manchester; May, 1979.

EM-33; "The Development of an Interlaboratory Testing Program for Construction Aggregates", by Lise Manchester; December, 1979.

EM-47; "Interlaboratory Reference Sample Programs for Aggregate, Asphalt, Concrete and Soil Tests", by B. Chojnacki, C. Rogers, and J.I. McDougall; May, 1981.

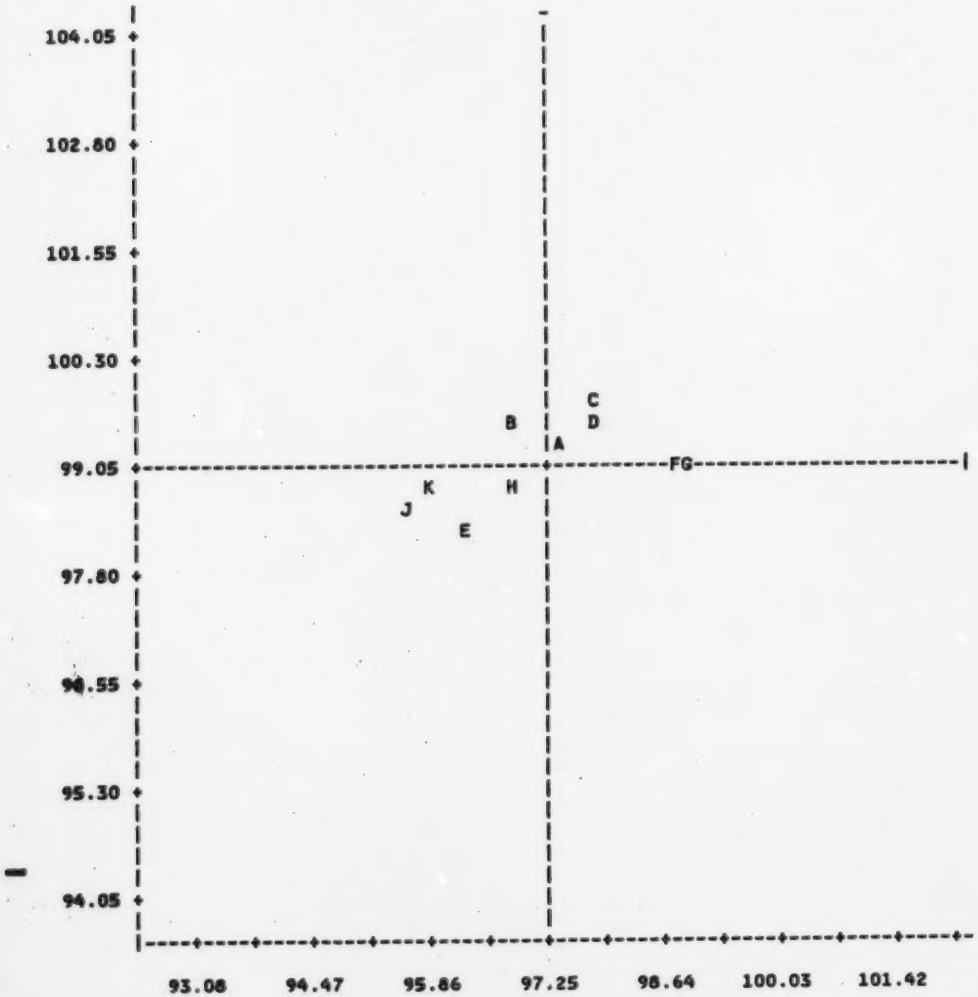
TEST 40: PERCENT PASSED ON 2.00 MM SIEVE (PARTICLE SIZE ANALYSIS)

SCATTER PLOT ANALYSIS

SCALE: 0.556 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 2 = B
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	97.340	99.070
MEDIAN	97.250	99.050

NO OF POINTS IN EACH QUADRANT

NE = 5
SE = 0

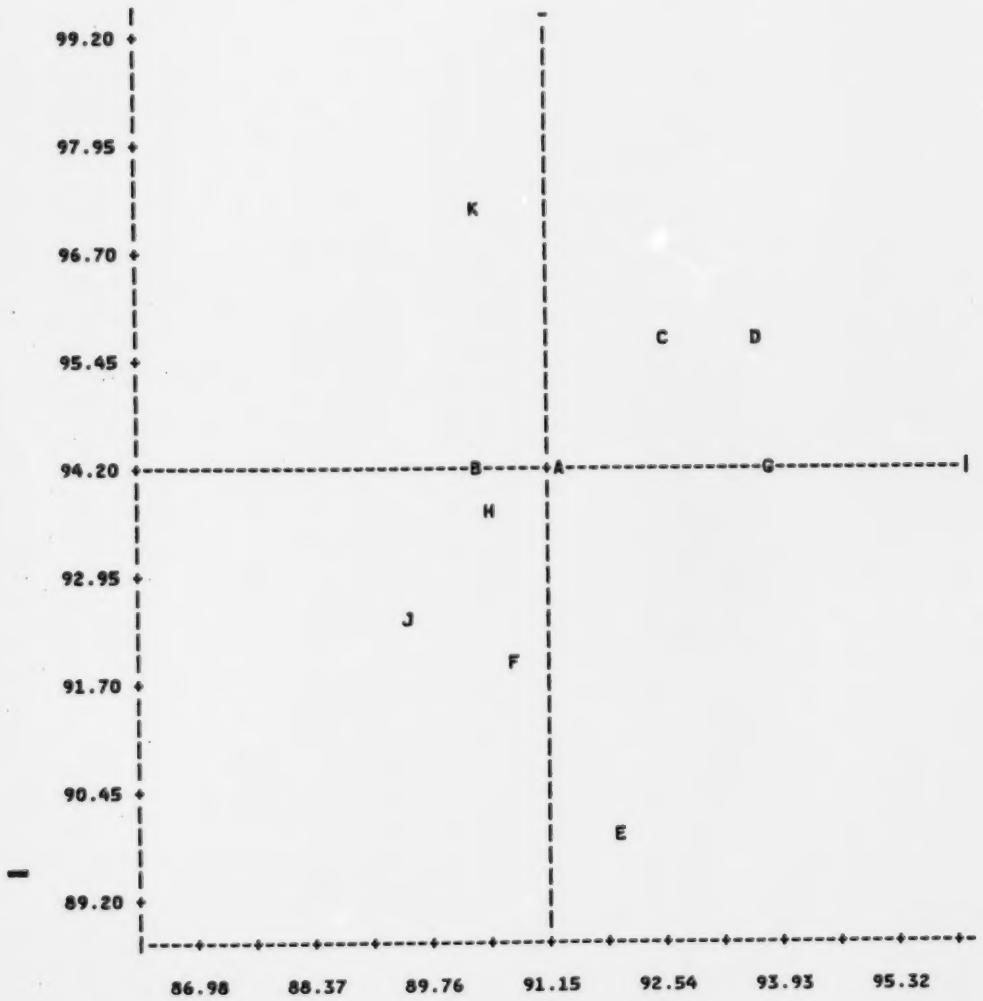
TEST 41: PERCENT PASSED ON 425 MM SIEVE (PARTICLE SIZE ANALYSIS)

SCATTER PLOT ANALYSIS

HORIZONTAL AXIS: MATERIAL 1

SCALE: 0.556 UNITS=1 CM

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 2 = B
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	91.610	93.960
MEDIAN	91.150	94.200

NO OF POINTS IN EACH QUADRANT

NE = 4
SE = 1

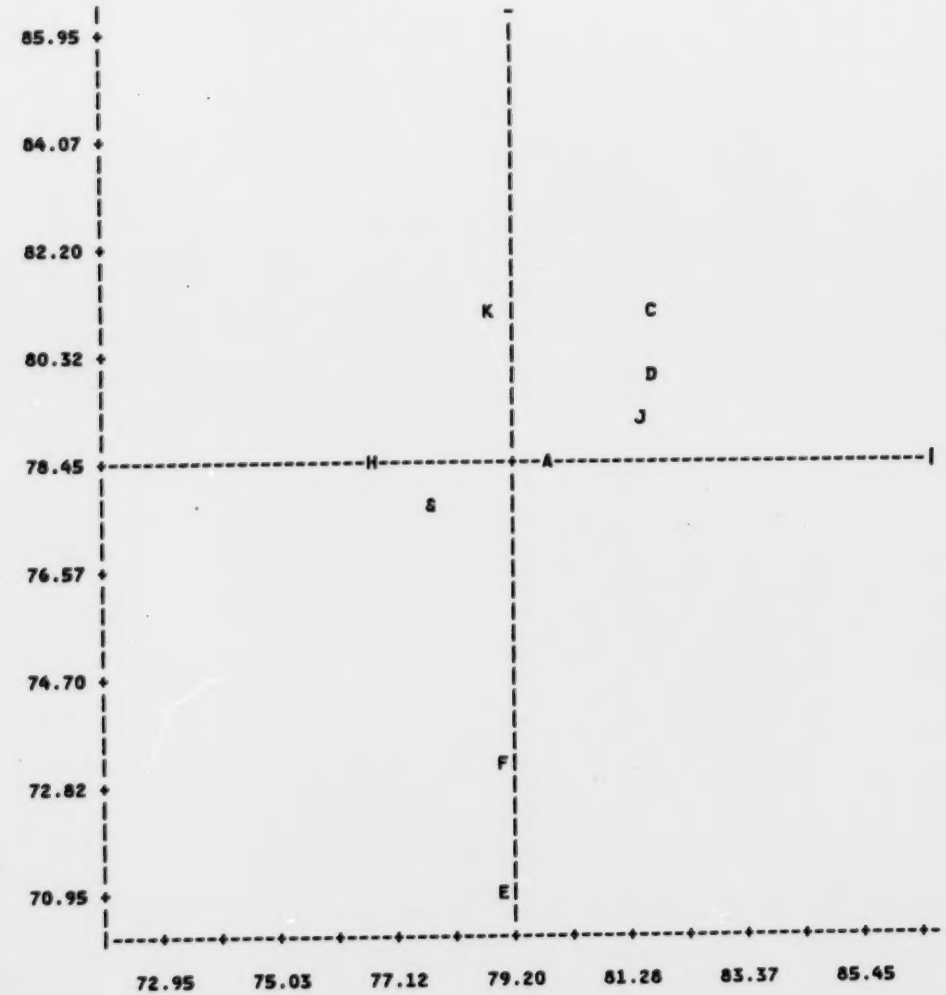
TEST 42: PERCENT PASSED ON 75 UM SIEVE (PARTICLE SIZE ANALYSIS)

SCATTER PLOT ANALYSIS

SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 2 = B
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	79.600	77.810
MEDIAN	79.200	78.450

NO OF POINTS IN EACH QUADRANT

NE = 4
SE = 0

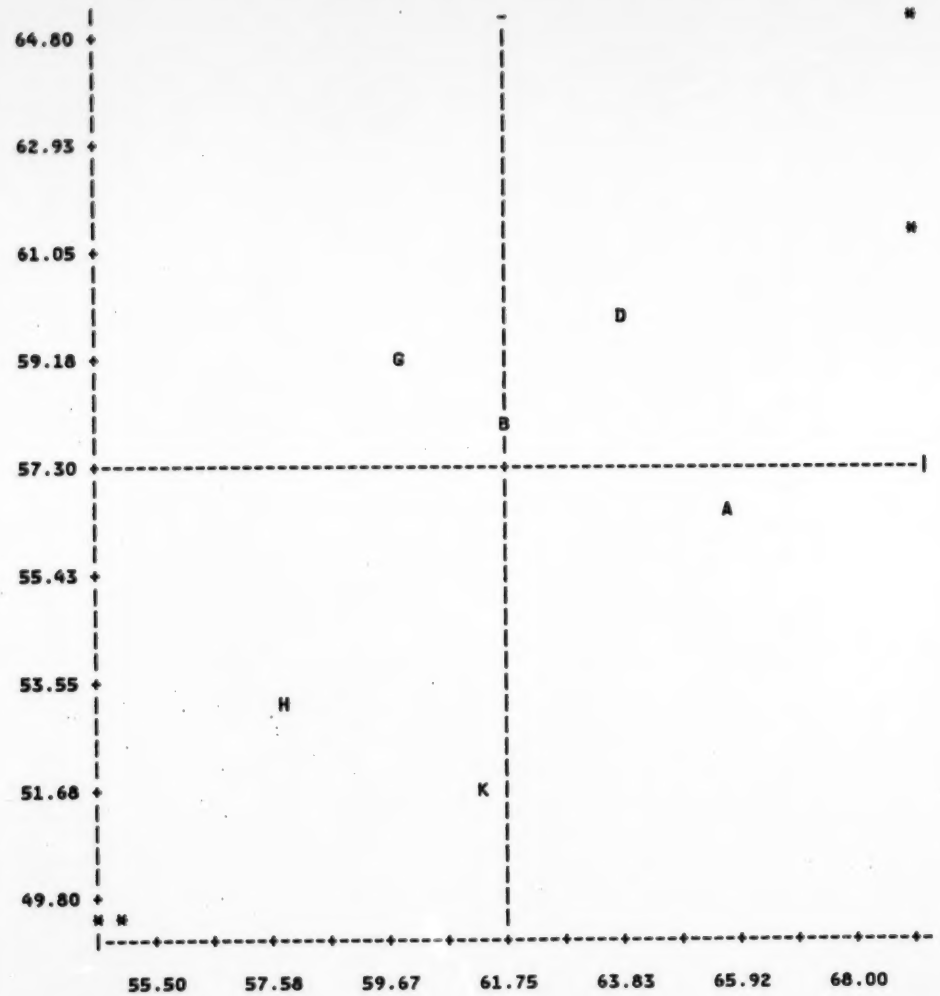
TEST 43: PERCENT PASSED ON 20 UM SIEVE (PARTICLE SIZE ANALYSIS)

SCATTER PLOT ANALYSIS

SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 2 = B
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	62.770	54.280
MEDIAN	61.750	57.300

NO OF POINTS IN EACH QUADRANT

NE = 1
SE = 1

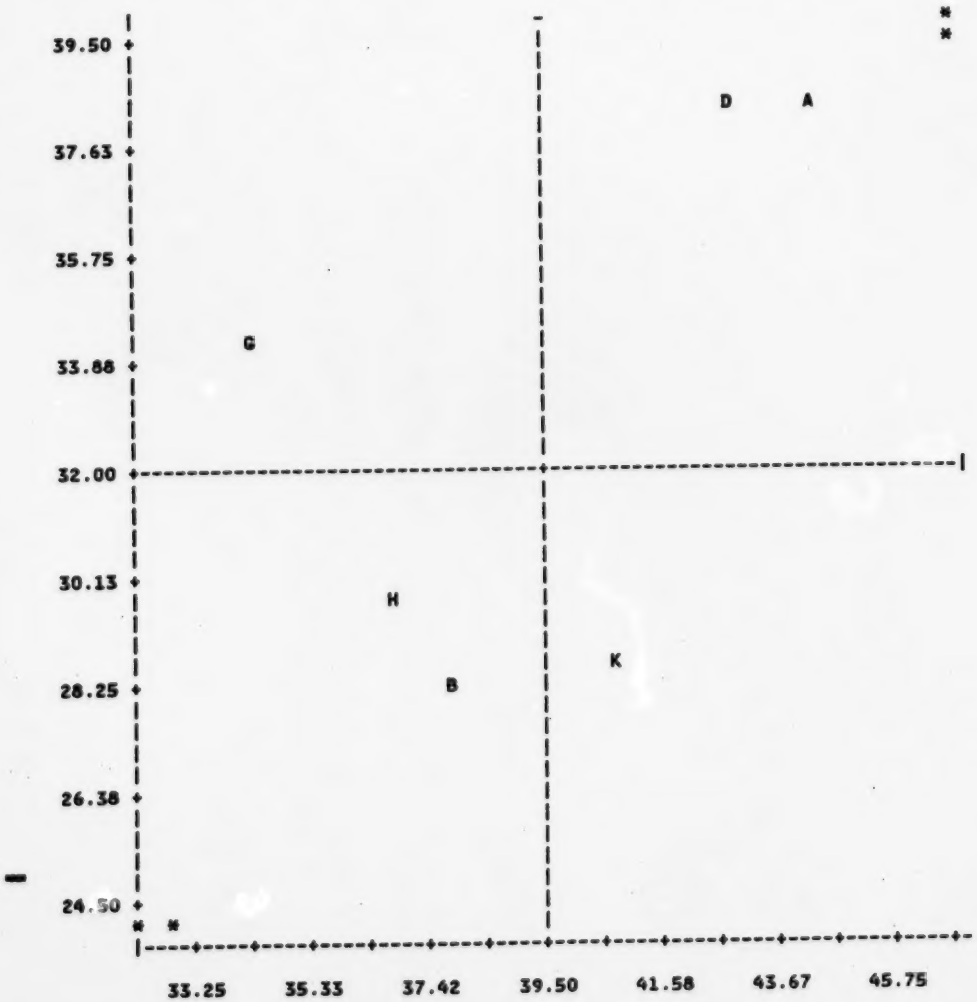
TEST 44: PERCENT PASSED ON 5 UM SIEVE (PARTICLE SIZE ANALYSIS)

SCATTER PLOT ANALYSIS

HORIZONTAL AXIS: MATERIAL 1

SCALE: 0.833 UNITS=1 CM

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 2 = B
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	41.520	32.690
MEDIAN	39.500	32.000

NO OF POINTS IN EACH QUADRANT

NE = 2
SE = 1

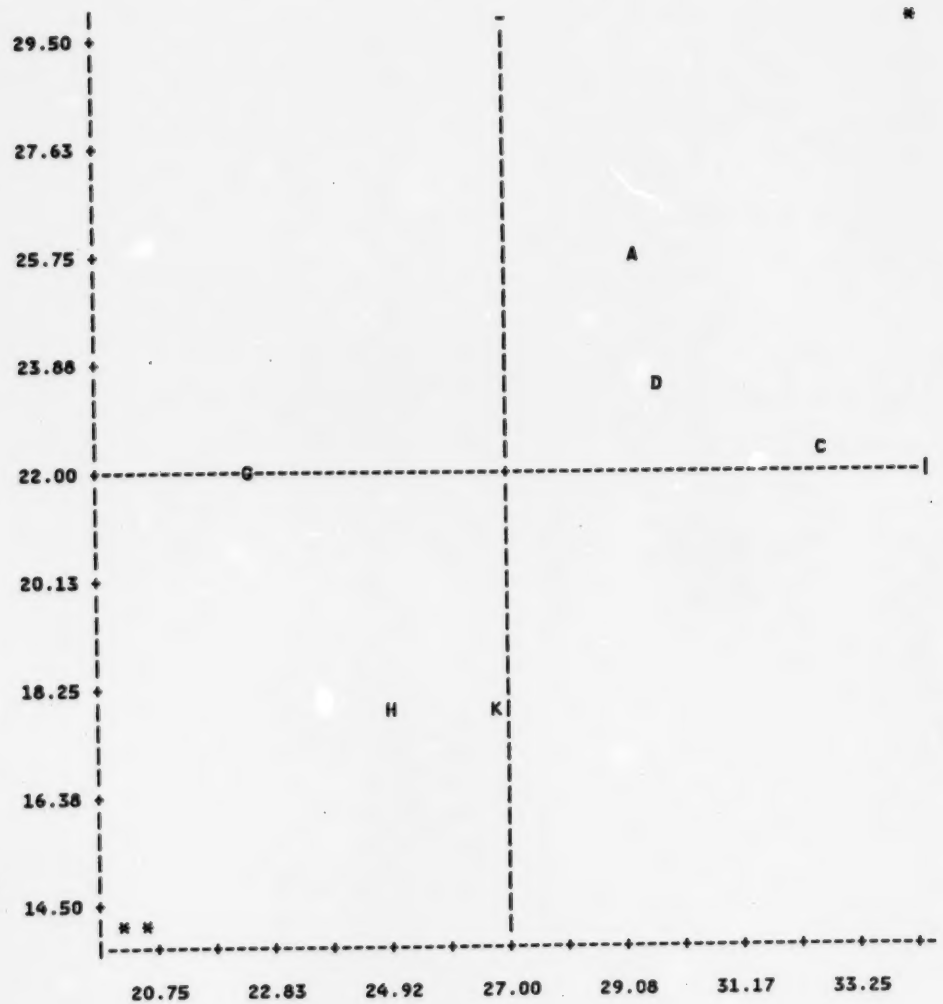
TEST 45: PERCENT PASSED ON 2 UM SIEVE (PARTICLE SIZE ANALYSIS)

SCATTER PLOT ANALYSIS

SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	28.567	20.711
MEDIAN	27.000	22.000

NO OF POINTS IN EACH QUADRANT

NE = 3
SE = 0

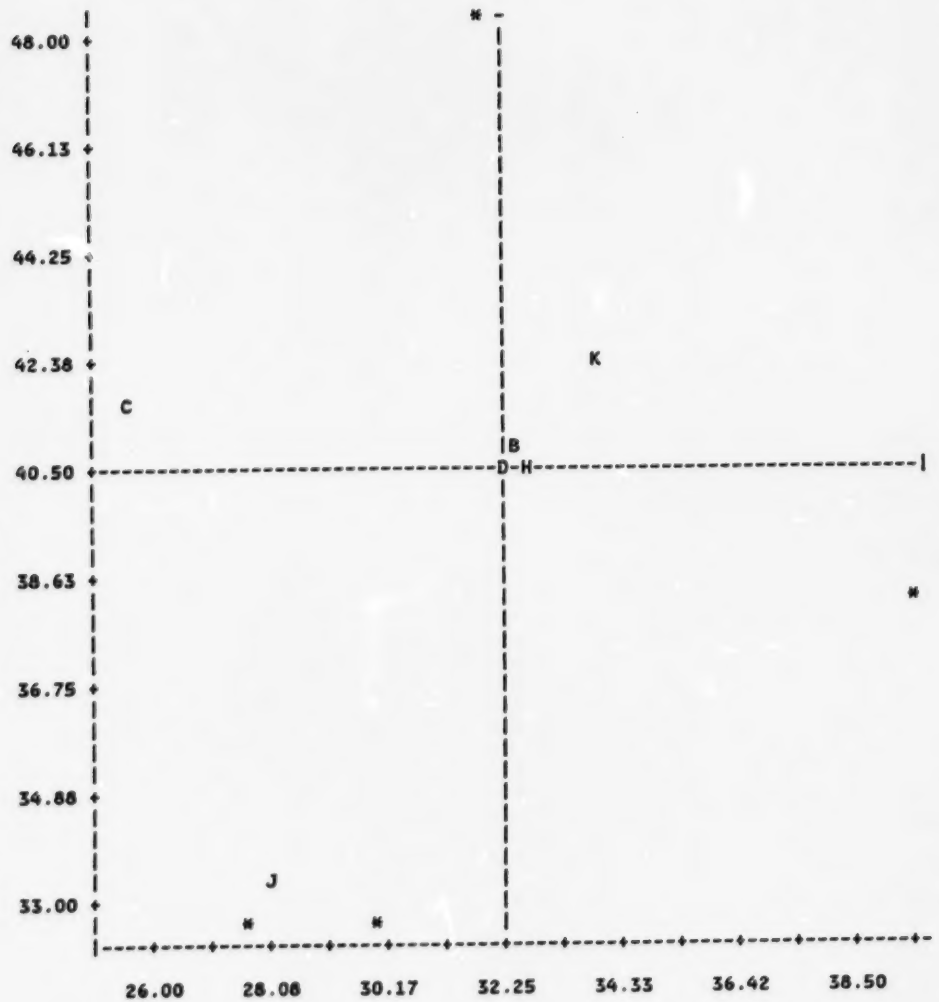
TEST 46: LIQUID LIMIT, %

SCATTER PLOT ANALYSIS

SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1	= A
LAB. NO. 2	= B
LAB. NO. 4	= C
LAB. NO. 6	= D
LAB. NO. 12	= E
LAB. NO. 13	= F
LAB. NO. 14	= G
LAB. NO. 27	= H
LAB. NO. 66	= J
LAB. NO. 67	= K

	MATERIAL 1	MATERIAL 2
MEAN	31.650	39.330
MEDIAN	32.250	40.500

NO OF POINTS IN EACH QUADRANT

NE = 3
SE = 0

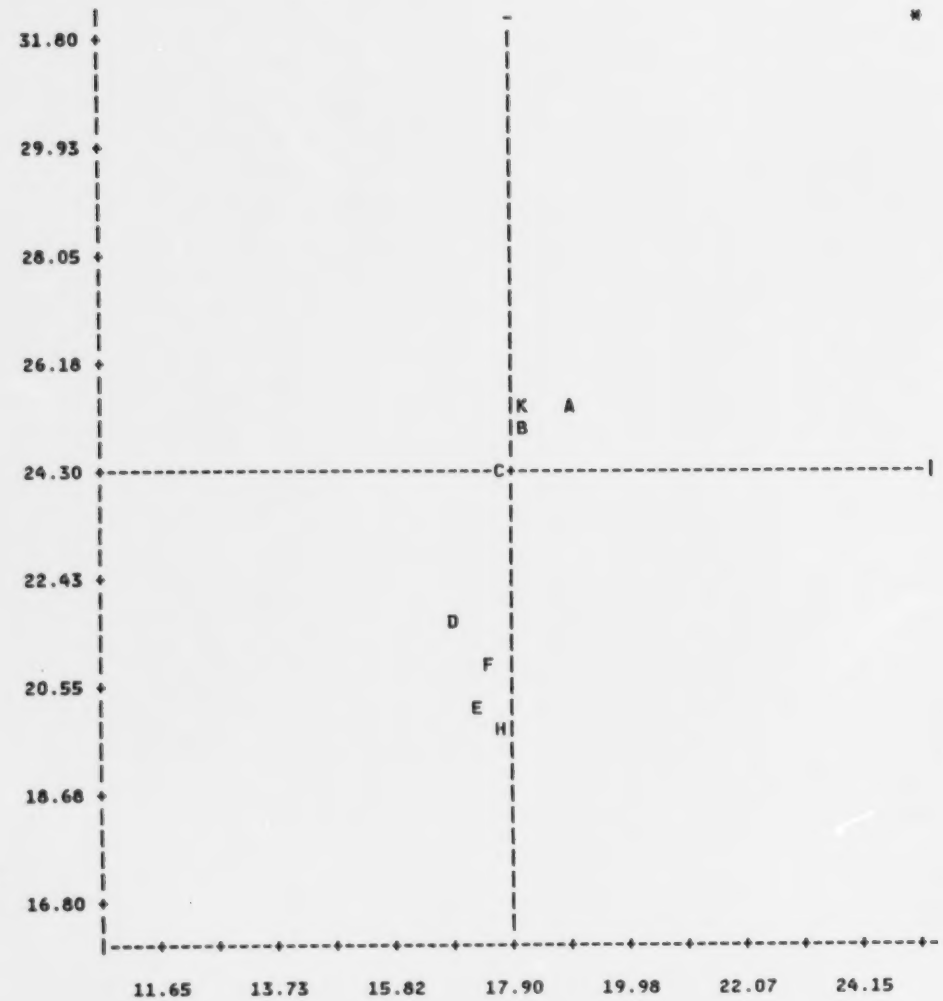
TEST 47: PLASTIC LIMIT, %

SCATTER PLOT ANALYSIS

SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1 = A
LAB. NO. 2 = B
LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	19.700	24.200
MEDIAN	17.900	24.300

NO OF POINTS IN EACH QUADRANT

NE = 3
SE = 0

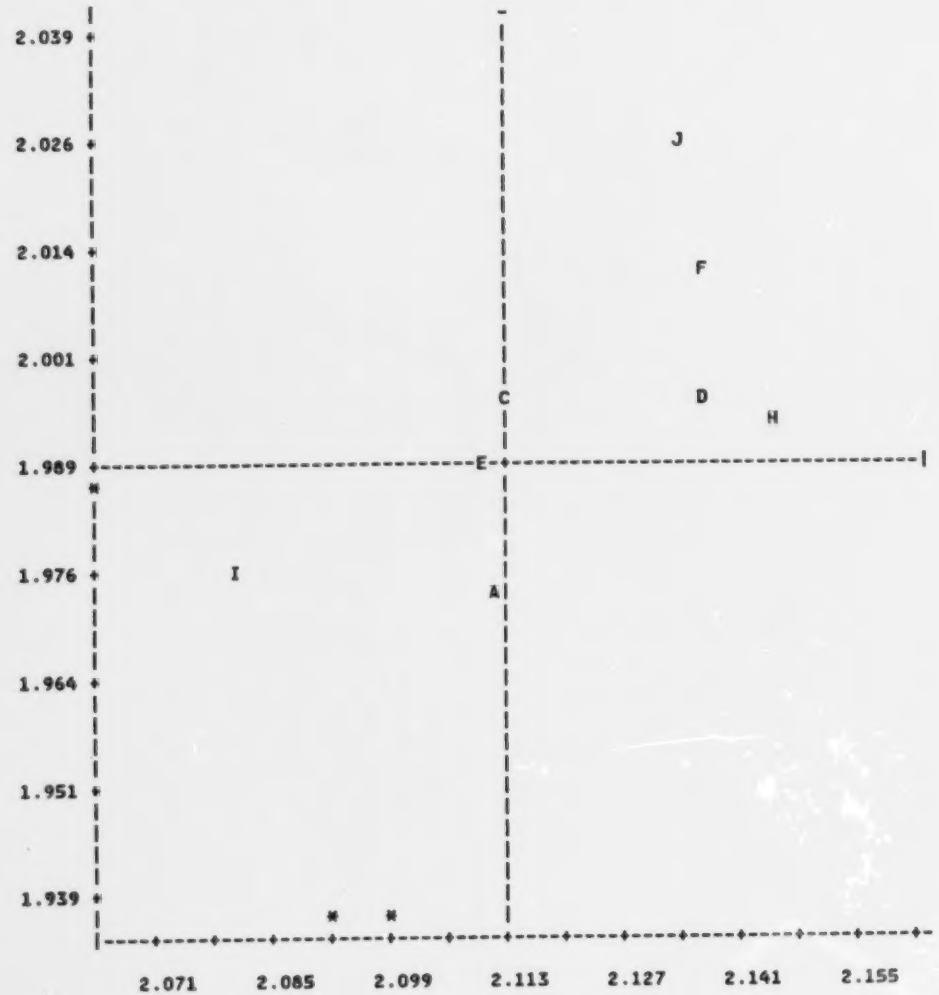
TEST 50: MAXIMUM WET DENSITY G/CM3 (MOISTURE - DENSITY RELATIONSHIP)

SCATTER PLOT ANALYSIS

SCALE: 0.006 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1	= A
LAB. NO. 2	= B
LAB. NO. 4	= C
LAB. NO. 6	= D
LAB. NO. 12	= E
LAB. NO. 13	= F
LAB. NO. 14	= G
LAB. NO. 27	= H
LAB. NO. 38	= I
LAB. NO. 66	= J
LAB. NO. 67	= K

	MATERIAL 1	MATERIAL 2
MEAN	2.105	1.975
MEDIAN	2.113	1.989

NO OF POINTS IN EACH QUADRANT

NE = 4
SE = 0

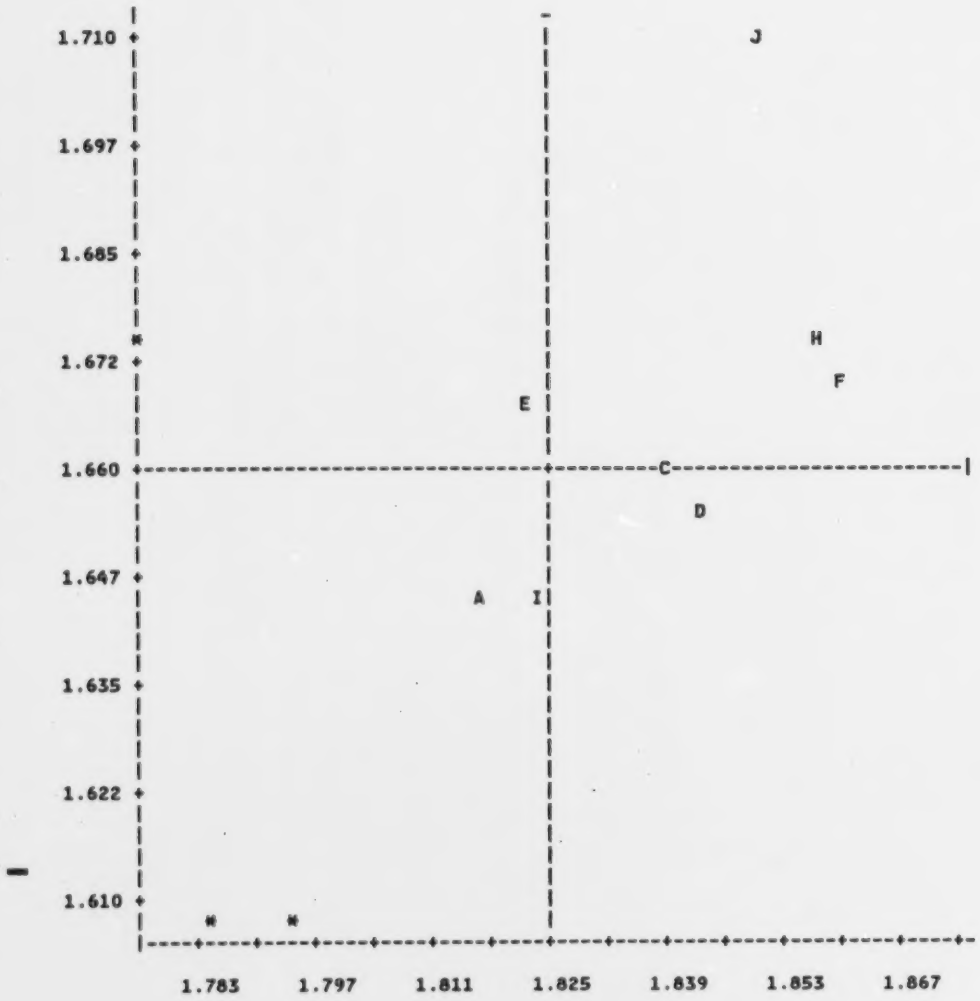
TEST 51: MAXIMUM DRY DENSITY G/CM3 (MOISTURE - DENSITY RELATIONSHIP)

SCATTER PLOT ANALYSIS

SCALE: 0.006 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



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LAB. NO. 12 = E
LAB. NO. 13 = F
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LAB. NO. 27 = H
LAB. NO. 38 = I
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	1.819	1.656
MEDIAN	1.825	1.660

NO OF POINTS IN EACH QUADRANT

NE = 4
SE = 1

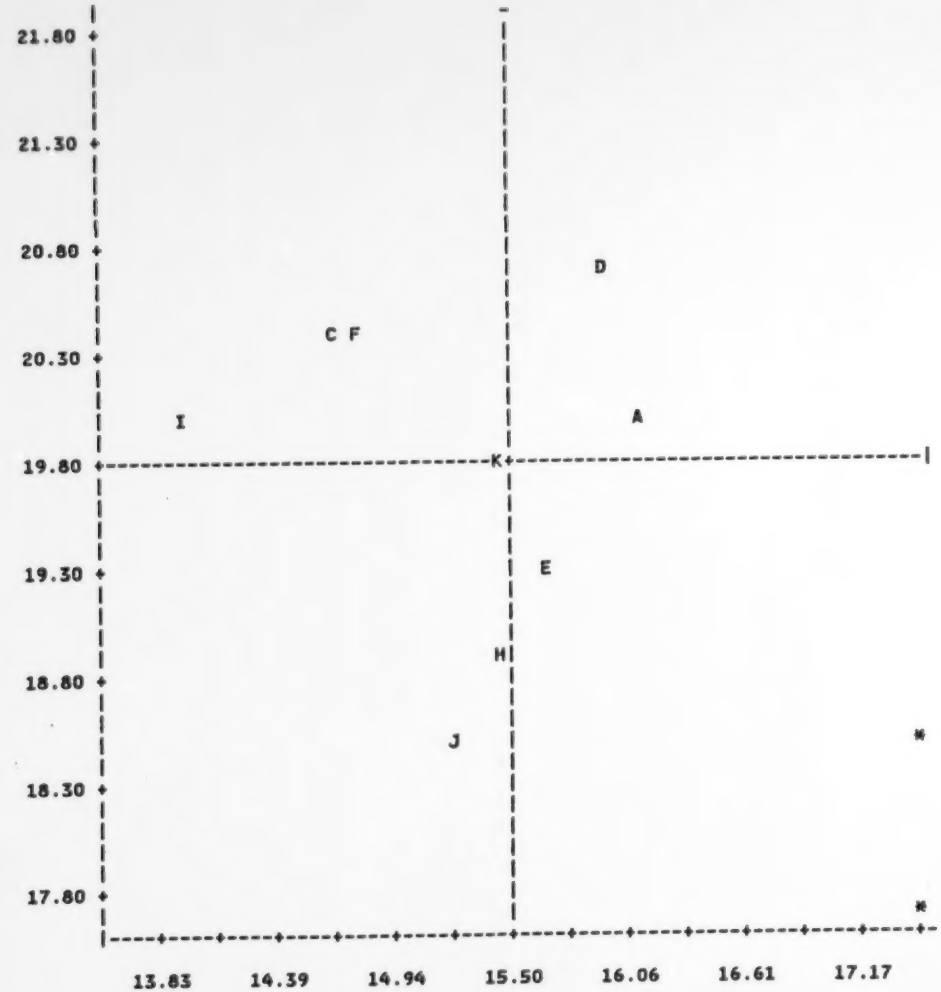
TEST 52: OPTIMUM MOISTURE, % (MOISTURE - DENSITY RELATIONSHIP)

SCATTER PLOT ANALYSIS

SCALE: 0.222 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1

VERTICAL AXIS: MATERIAL 2



LEGEND

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LAB. NO. 4 = C
LAB. NO. 6 = D
LAB. NO. 12 = E
LAB. NO. 13 = F
LAB. NO. 14 = G
LAB. NO. 27 = H
LAB. NO. 38 = I
LAB. NO. 66 = J
LAB. NO. 67 = K

	MATERIAL 1	MATERIAL 2
MEAN	15.827	19.309
MEDIAN	15.500	19.800

NO OF POINTS IN EACH QUADRANT

NE = 2
SE = 1